

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TALARI NETWORKS, INC.,
Petitioner,

v.

FATPIPE NETWORKS INDIA LIMITED,
Patent Owner.

Case IPR2016-00977
Patent 7,406,048 B2

Before STACEY G. WHITE, MICHELLE N. WORMMEESTER, and
CHRISTA P. ZADO, *Administrative Patent Judges*.

WHITE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Talari Networks, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) seeking to institute an *inter partes* review of claims 1–24 of U.S. Patent No. 7,046,048 (Ex. 1003, “the ’048 patent”) pursuant to 35 U.S.C. §§ 311–319. FatPipe Networks India Limited. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Based on our review of these submissions, we instituted *inter partes* review of claims 1–24 on the following specific grounds:

Reference(s)	Basis	Claims Instituted
Karol ¹	§ 102	1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21, 22, and 24
Karol	§ 103	1–24
Karol and Stallings ²	§ 103	1–5, 7–11, 13–17, and 19–23

Paper 7 (“Dec.”), 22. Patent Owner filed a Patent Owner’s Response (Paper 22, “PO Resp.”), and Petitioner filed a Reply (Paper 26, “Reply”). An oral hearing was held on August 14, 2017. Paper 31 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 1–24 of the ’048 patent are unpatentable.

¹ U.S. Patent No. 6,628,617 B1 (“Karol,” Ex. 1006).

² William Stallings, *Data and Computer Communications*, Prentice-Hall, 5th Ed, 1997, ISBN-81-203-1240-6 (“Stallings,” Ex. 1011).

B. Related Proceedings

The parties inform us that *FatPipe, Inc. v. Talari Networks, Inc.*, No. 5:16-CV-54-BO (E.D.N.C.) and *FatPipe, Inc. v. Viptela, Inc.*, No. DED-1-16-cv-00182 (D. Del.), may be impacted by this proceeding. Pet. 1, Paper 30, 1–2. In addition, Petitioner has a pending petition for *inter partes* review of a related patent, U.S. Patent No. 6,775,235 B2 (“the ’235 patent”) (IPR2016-00976). Pet. 2. Viptela, Inc. and Cisco Systems, Inc. also have filed petitions seeking *inter partes* review of various claims of the ’048 and ’235 patents. Paper 30, 3.

C. The ’048 Patent

The ’048 patent describes a system and method for communicating using two or more disparate networks in parallel. Ex. 1003, Abstract. For example, an embodiment of this system could be composed of a virtual private network (“VPN”) in parallel with a frame relay network. *Id.* at 1:19–24. These parallel networks back each other up in case of failure and when both networks are operational their loads are balanced between the parallel networks. *Id.* at Abstract. An embodiment of this system is depicted in Figure 10, which is shown below.

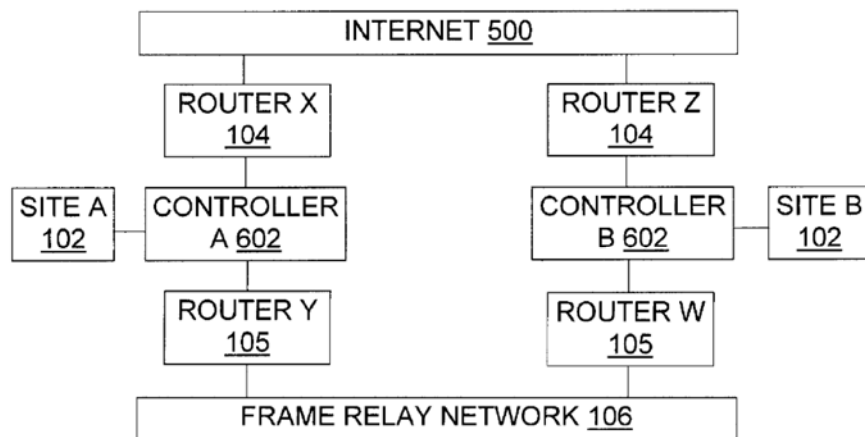


Fig. 10

Figure 10 depicts an example of the network topology described in the '048 patent. *Id.* at 8:22–23. Two sites 102 transmit and/or receive data from one another. *Id.* at 2:39–41. These sites are connected by two disparate networks, Internet 500 and frame relay network 106. *Id.* at 8:23–25. Each location has frame relay router 105 and Internet router 104. *Id.* at 8:25–26. “Access to the disparate networks at site A and site B is through an inventive controller 602 at each site.” *Id.* at 6:30–31. Controller 602 “allows load-balancing, redundancy, or other criteria to be used dynamically, on a granularity as fine as packet-by-packet, to direct packets to an Internet router and/or frame relay/point-to-point router according to the criteria.” *Id.* at 9:6–9.

Figure 7 of the '048 patent is reproduced below.

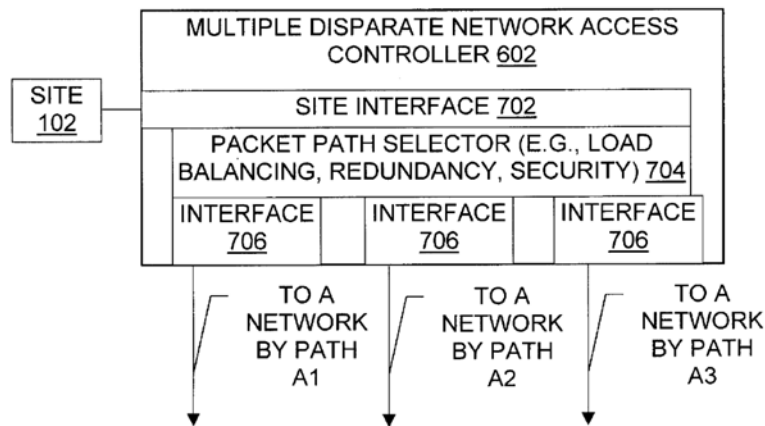


Fig. 7

Figure 7 depicts controller 602. *Id.* at 10:48–49. Controller 602 is connected to site 102 via site interface 702. *Id.* at 10:48–51. Packet path selector 704 is hardware or software that determines which path a given packet is to travel. *Id.* at 10:54–58. The criteria used to determine which path a packet travels may be based on concerns such as redundancy, load-balancing, or security. *Id.* at 10:61–11:50. Controller 602 also has two

or more network interfaces 706 (at least one per each network for which controller 602 controls access). *Id.* at 11:51–53.

D. Illustrative Claims

As noted above, we instituted review of claims 1–24 of the '048 patent, of which claims 1, 7, 13, and 19 are independent. Claims 1 and 7 are illustrative of the challenged claims and are reproduced below:

1. A controller which controls access to multiple independent disparate networks in a parallel network configuration, the disparate networks comprising at least one private network and at least one network based on the Internet, the controller comprising:
 - a site interface connecting the controller to a site;
 - at least two network interfaces which send packets toward the disparate networks; and
 - a packet path selector which selects between network interfaces, using at least two known location address ranges which are respectively associated with disparate networks, according to at least: a destination of the packet, an optional presence of alternate paths to that destination, and at least one specified criterion for selecting between alternate paths when such alternate paths are present;wherein the controller receives a packet through the site interface and sends the packet through the network interface that was selected by the packet path selector.
7. A method for combining connections for access to disparate parallel networks, the method comprising the steps of:
 - receiving at a controller a packet which has a first site IP address as source address and a second site IP address as destination address;
 - selecting, within the controller on a per-packet basis, between a path through an Internet-based network and a path through a private network that is not Internet-based; and
 - forwarding the packet along the selected path toward the second site.

II. CLAIM CONSTRUCTION

In an *inter partes* review, “[a] claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b). Under this standard, we construe claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

“selecting . . . on a per-packet basis, between a path through an Internet-based network and a path through a private network that is not Internet-based” (Claim 7) / “selects . . . on a per-packet basis, between a path through an Internet-based network and a path through a private network that is not Internet-based” (claim 19)

Patent Owner contends that one of ordinary skill in the art would have understood these phrases to mean “for each packet, make[] a discrete choice between network a path through an Internet-based network and a path through a private network that is not Internet based.” PO Resp. 9 (citing Ex. 2003 ¶¶ 34–41). Petitioner asserts that if we determine that these phrases need construction the proper construction is “for each packet a path is chosen.” Reply 7.

First, Patent Owner asks that we construe the selecting/selects terms of this phrase to mean making a discrete choice between two or more possibilities. PO Resp. 9–10. Petitioner asserts that there is no basis for Patent Owner’s proposed “discrete choice” language. Reply 4. We are not persuaded that, for the purposes of this Decision, there is meaningful

information to be gleaned by construing the words selecting/selects to mean “make a choice.” We also are not persuaded that there is a basis for inserting the word “discrete” into this construction. Therefore, based on the disputes before us, we see no reason to provide an express construction for the common terms select/selection.

Patent Owner contends that the term “per-packet” would have been understood to require a selection for each packet. PO Resp. 10. Thus, Patent Owner asserts that there must be a path selection process performed for each individual packet. *Id.* Petitioner argues that this is too narrow of a view of the claim terms and asserts that the specification describes making a single selection that applies to each packet in a group. Reply. 3–4.

In support of their arguments both parties direct us to Figure 9 and its supporting text. Figure 9 is reproduced below.

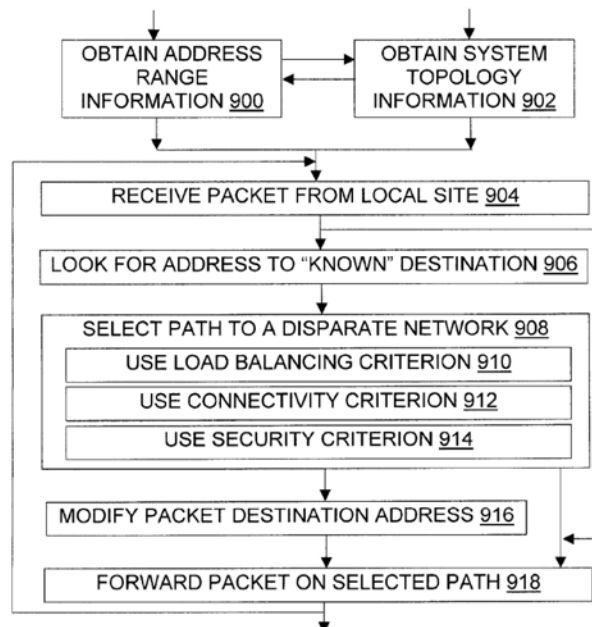


Fig. 9

Figure 9 “is a flowchart illustrating methods of the present invention for combining connections to send traffic over multiple parallel independent

disparate networks.” Ex. 1003, 5:44–47. The parties direct us to the discussion of step 908, which states that

[d]uring a path selecting step 908, the path selector 704 selects the path over which the packet will be sent; selection is made between at least two paths, each of which goes over a different network 106 than the other. The disparate networks are independent parallel networks. This path selecting step 908 may be performed once per packet, or a given selection may pertain to multiple packets.

Id. at 14:27–33.

As described in the specification, Figure 9 depicts “methods” for selecting paths. *See id.* at 5:46. These methods allow for the selection to “be performed once per packet, *or* a given selection may pertain to multiple packets.” *Id.* at 14:32–33 (emphasis added). Thus, we find that the specification discloses both selection for each individual packet and selection for a group of packets.

Next, we examine the claims to see whether claims 7 and 19 cover both of the embodiments or whether they are directed only to the embodiment wherein the selection occurs for each individual packet. Independent claim 7 recites, in relevant part, “selecting, within the controller on a per-packet basis.” Independent claim 19 recites, in relevant part, “a packet path selector which selects, within the controller on a per-packet basis.” The language of both claims is similar and may be contrasted with the language of the other independent claims. Claim 1 recites in relevant part, “a packet path selector which selects between network interfaces.” Similarly, claim 13 recites, in relevant part, “selecting between at least two network interfaces of the controller.” The path selection terms found in claims 1 and 13 do not include language tying the path selection to a packet.

Claims 7 and 19, in contrast, expressly state that the selection occurs on a per-packet basis. We find that this language indicate a that the Patentee intended claims 7 and 19 to have a different scope than claims 1 and 13.

In the “per-packet” claims, the specification and claim language lead us to conclude that the Patentee drafted its claim language in a manner so as to focus on the embodiment discussed in the ’048 patent wherein the selection occurs for each individual packet. The language of claims 1 and 13 is broader and encompasses both selection for an individual packet and a selection performed for a group of packets. Such a drafting choice is within the purview of the Patentee, and we see no reason why we must construe claim 1 and 19 in a manner that would encompass all embodiments. The Patentee’s choice to describe the selection as occurring “on a per-packet basis” when viewed in light of the specification and the other claims indicates a decision to direct claims 7 and 19 to the embodiment in which routes are selected for each packet. As such, we find that the language of claims 7 and 19 indicates that these claims are directed to the embodiment wherein path selection is performed for each individual packet. Therefore, we construe “selecting/selects . . . on a per-packet basis” to mean “selecting a network path for each packet.”³

³ Patent Owner’s proposed construction also included language specifying the networks (Internet-based and not Internet-based), however, there was no specific argument on this point. In addition, the claims already specify the networks from which the selection is to be made and thus, we see no reason to include this in the construction.

III. ANALYSIS

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish the facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Thus, we examine the full record in this matter to determine whether Petitioner has met its burden under 35 U.S.C. § 316(e).

A. Asserted Ground of Unpatentability over Karol

Petitioner asserts that claims 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21, 22, and 24 are anticipated by the disclosures of Karol. Pet. 10–30. Petitioner also argues that claims 1–24 would have been obvious over the teachings of Karol. *Id.* at 42–60. Petitioner supports its arguments with a declaration from Dr. Kevin Negus. Ex. 1005.

1. Overview of Karol

Karol is directed to “the internetworking of connectionless (e.g., Internet Protocol or ‘IP’) and connection oriented (e.g., ATM, MPLS, RSVP) networks.” Ex. 1006, 1:7–10. Connectionless (“CL”) networks require no explicit connection setup prior to transmitting datagrams. *Id.* at 1:19–24. In contrast, connection oriented (“CO”) networks determine a route for the connection and allocate bandwidth resources along the route. *Id.* at 1:31–39. Figure 1 of Karol is reproduced below.

FIG. 1

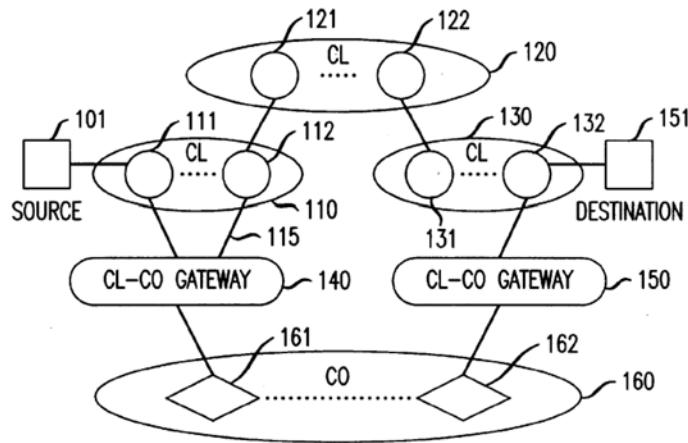


Figure 1 depicts CO and CL networks in a parallel configuration. *Id.* at 4:12–14. Datagrams ultimately destined for endpoint 151 may be sent from source 101 to node 111 in CL network 110. *Id.* at 4:39–40. The source or destination may be connected directly to CL-CO gateway 140 or they may be connected through a node in the network. *Id.* at 5:5–8. The datagrams may be routed over either the CO or CL network in order to arrive at endpoint 151. *Id.* at 4:40–43. CL-CO gateways 140 and 150 interconnect the CL and CO networks and “allow[] datagrams (sometimes hereinafter called messages) originated on the CL network to be transported . . . on the CO network.” *Id.* at 3:30–37. “When a datagram arrives at CL-CO gateway 140 of FIG. 1, a determination is made if that packet should be carried by CO network 160.” *Id.* at 5:23–25. CL-CO gateway 140 is described in more detail in Figure 4, which is reproduced below.

FIG. 4

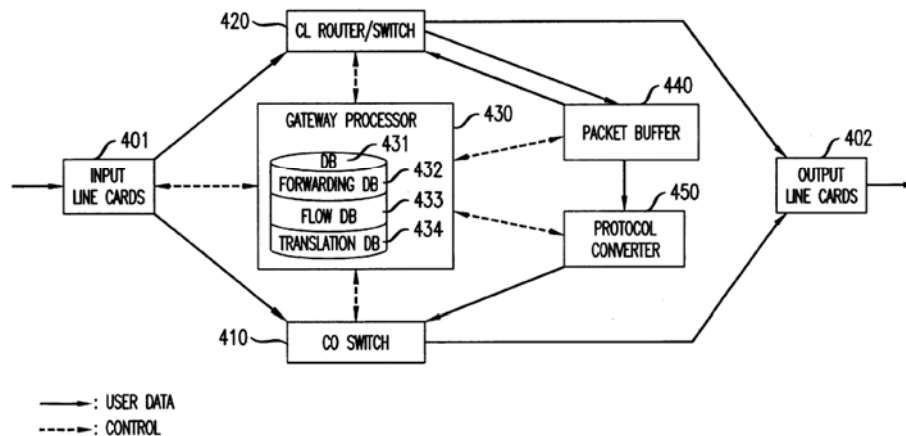


Figure 4 illustrates the internal arrangements of CL-CO gateway 140. *Id.* at 6:31–32.

Generally speaking, each CL-CO gateway arranged in accordance with the present invention includes hardware and software modules that typically comprise (a) a switch fabric for CO networking, shown in FIG. 4 as CO switch 410, (b) a CL packet forwarding engine, shown in FIG. 4 as CL router/switch 420, (c) a protocol converter 450, (d) a moderately sized packet buffer 440 for temporarily storing packets waiting for CO network setup or turnaround; and (e) a processor 430 and associated database 431 for controlling the gateway packet handling operations and for storing forwarding, flow control, header translation and other information. Input line cards 401 and output line cards 402 connect the gateway of FIG. 4 to external networks, such that datagrams received in input line cards 401 can be directed either to CO switch 410 or CL router/switch 420, and such that output line cards 402 can receive datagrams from either of the last mentioned elements and direct them to external networks.

Id. at 6:32–50. The elements depicted in Figure 4 are controlled by processor 430 and such control is implemented via programs stored in the processor. *Id.* at 6:55–59. The routing procedures used by gateway 140

may adjust routing dynamically “to divert connections away from overloaded call processors.” *Id.* at 17:64–67. In other words, routing “can be adjusted to reflect bandwidth availability.” *Id.* at 18:1–2.

2. Independent Claims 1 and 13

Petitioner asserts that claims 1 and 13 are anticipated by (Pet. 10–18, 27) or would have been obvious over Karol (*id.* at 42–48, 57–58). Based on our review of the full record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 13 are anticipated by Karol and would have been obvious over Karol.

Claim 1 recites “a controller which controls access to multiple. . . networks.” Independent claim 13 recites limitations similar to those of claim 1, and Petitioner cites similar disclosures from Karol in support of its contention that claim 13 is anticipated by Karol. *Compare* Pet. 10–18 (assertions regarding claim 1), *with* Pet. 27 (assertions regarding claim 13). In addition, Patent Owner puts forth similar arguments with respect to Petitioner’s contentions regarding claims 1 and 13. For brevity, we shall discuss these claims together. Petitioner’s arguments as to independent claims 1 and 13 may be summarized as follows: Petitioner argues in the alternative that the claimed controller that provides access to multiple networks may be either Karol’s CL-CO gateway alone or the gateway in combination with one or more routers or switches. Pet. 10–12. If the controller is the gateway alone, then Petitioner asserts that the site interface is disclosed by one or more of Karol’s input line cards 401 or the network connection depicted in Figure 1 between source 101 and node 111. *Id.* at 12. If the controller is the gateway in combination with routers and/or switches, then the site interface is a network connection. *Id.* at 12–13. As to the “at

least two network interfaces,” Petitioner relies on Karol’s disclosure of at least two output line cards 402 that receive datagrams from the CO switch or CL router/switch and directs the datagrams to external networks. *Id.* at 13–14. In regard to the packet path selector, Petitioner points to Karol’s gateway processor, CL router/switch, CO switch, packet buffer, protocol converter and input line cards to disclose this element of the claim. *Id.* at 14. These items work together in Karol to determine if a packet (“datagram”) from a source should be forwarded to either the CL or CO network. *Id.* at 14–15. We find that this evidence, when considered in light of Patent Owner’s arguments and evidence, is sufficient to show the unpatentability of claims 1 and 13.

Patent Owner argues that Petitioner has not shown that the recited “site interface” is disclosed by Karol. PO Resp. 26. Petitioner asserts that a “site” in Karol could be either the routers/switches connected to the CL-CO gateway and/or the source 101 and/or destination 151 endpoints, if the CL-CO gateway alone is the “controller,” and the “site interface” would be one or more of the input line cards 401 or a network connection. Pet. 12 (citing Ex. 1005 at ¶¶ 164–165, 167; Ex. 1006, 3:44–51, 4:36–44, 4:65–67, 6:44–50 and Figs. 1 and 4). In the alternative, Petitioner asserts that the “controller” could be the gateway in combination with one or more routers and/or switches and then the “site” would be Karol’s source 101 or destination 151 endpoints and the “site interface” would be the network connection. *Id.* at 12–13.

Patent Owner contends that Karol does not teach the recited “site interface” because Karol’s gateway (controller) only has “network interfaces” and does not have a “site interface.” PO Resp. 26. According to

Patent Owner, “[t]he ‘site interface’ and the ‘network interfaces’ are separately claimed components that specifically connect the controller to a site and two or more networks, respectively.” *Id.* at 28. Patent Owner acknowledges that Karol’s Figure 1 shows an interface between source 101 and node 111. *Id.* at 30. Patent Owner, however, contends that this is not the site interface because the controller must be a single device (CL-CO gateway) and, thus, the interface between source 101 and node 111 is not part of the controller as required by claims 1 and 13. *Id.* at 26–27.

Petitioner points out that claim 1 recites a controller “comprising” a site interface, at least two network interfaces, and a packet path selector. Petitioner contends, and we agree, that the use of the open ended term “comprising” permits the controller to include other elements and other devices beyond those specifically recited. Reply 11. Thus, Petitioner argues that claim 1⁴ explicitly defines the controller as a plurality of devices. *Id.* at 10–11. Further, “[t]he claims [] do not preclude the use of routers and switches as part of the ‘controller’ to connect to the site because there is no requirement of a ‘direct connection’ between the site and controller.” *Id.* at 11. Therefore, the controller properly may include the gateway and node 111. *Id.* Node 111 contains an interface to Source 101, and, therefore, Petitioner argues that these disclosures would have taught the recited site interface. *Id.* at 10.

⁴ Claim 13 is a method claim that does not include the same comprising language, but we have not been directed to any evidence sufficient to show that the controller of claim 1 should be construed in a different manner from the controller of claim 13. *See Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1328 (Fed. Cir. 2006) (construing the term gap to have the same meaning in two different claims).

We find Petitioner’s arguments and evidence to be persuasive. We agree with Petitioner’s contention that the “comprising” language used in claim 1 is broad enough to encompass a controller that includes multiple devices. As such, we see no impediment to considering node 111 as part of the constellation of devices that is within the scope of the recited controller. We determine that the interface between node 111 and source 101 would have taught the recited site interface. As an additional finding, we note that Karol discloses a direct connection between the source or destination site and the gateway. Ex. 1006, 5:5–8. Thus, we find that Petitioner has put forth sufficient evidence to show the recited site interface is disclosed in Karol.

Patent Owner also argues that Karol does not disclose “using at least two known location address ranges which are respectively associated with disparate networks.” PO Resp. 32–35. According to Patent Owner, “Karol does not explicitly or inherently disclose the use of address ranges in the flow database, only singular source and destination IP addresses.” *Id.* at 32. Patent Owner explains that in the ’048 patent

an ‘address range’ is represented as an IP address with portions containing an “x,” which indicates that the full range of values possible for that address portion. The use of “.x.x” notation in the ’048 specification makes it clear that an address range is not a single address and is not a collection of disjoint addresses as in a routing table, but is instead a group of contiguous addresses.

Id. at 34 (citing Ex. 1003, 8:37–59).

We, however, are not convinced that the ’048 patent’s disclosure is so limited. The specification provides examples of address ranges, but it does not require a specific format. For example, “[a]ddress ranges *may be*

specified as partial addresses, e.g., partial IP addresses in which some but not all of the address is specified. Thus, ‘198.x.x.x’ indicates an IP address in which the first field is 198 and the other three address fields are not pinned down, corresponding to the range of addresses from 198.0.0.0 to 198.255.255.255.” Ex. 1003, 13:27–33 (emphasis added). This passage describes one way in which an address range may be represented. It, however, does not establish that a range must include more than one address. In addition, “a network *may have more than one* associated contiguous range of addresses which collectively constitute the address range for that network.” *Id.* at 13:34–36. Here, the specification provides an example of an address range composed of one or more ranges, but it does not require any particular number of addresses to be included in the range. We further note that the specification states that “in the claims a reference to an item normally means *at least one* such item is required.” Ex. 1003, 16:43–45 (emphasis added). Thus, based on our review of the intrinsic record, we find that the claimed address range is broad enough to include a single address.

Petitioner relies upon Karol’s discussion of “routing table information, which include[s] the location address ranges associated with the CL and CO network paths” to disclose this limitation. Ex. 1005 ¶ 180; Pet. 14–15. Specifically, Petitioner directs us to Karol’s forwarding database 432, which stores the address of the next hop router, destination address, and the outgoing port. *Id.* at 15–16 (citing Ex. 1006, 7:36–41; Ex. 1005 ¶ 94, 178). In addition, Karol has a flow database 433, which stores similar information for use in the CO network. *Id.* at 16 (citing Ex. 1006, 7:42–54, Ex. 1005 ¶¶ 95, 179). Petitioner contends that the addresses stored in these databases are used to route flows to either the CO or CL network. *Id.* at 14–

15 (citing Ex. 1006, 16:3–9; Ex. 1005 ¶¶ 104–108, 180). We find that Petitioner has shown sufficiently that Karol’s routing tables are used to obtain addresses that are associated with Karol’s CO and CL networks. Thus, we find that Petitioner has made a sufficient showing as to this limitation and we are not convinced by Patent Owner’s arguments.

Based on our review of the full record, we find that Petitioner has demonstrated the unpatentability of claims 1 and 13 as anticipated by Karol. Thus, we determine that Petitioner has met its burden to demonstrate by a preponderance of the evidence that Karol anticipates claims 1 and 13.

Petitioner, however, also argues that claims 1 and 13 would have been obvious over Karol. Petitioner relies upon the above described disclosure from Karol and expands upon its anticipation arguments with arguments in which it explains why Karol combined with the knowledge of one of ordinary skill in the art would have rendered claims 1 and 13 obvious. Pet. 42–48, 57–58.

Petitioner argues that the recited address ranges would have been obvious over Karol and the knowledge of one of ordinary skill in the art. Pet. 42–48, 57–58. Petitioner contends that if this claim were construed to require the range to contain more than one address then it would have been obvious to modify Karol to use a range that includes more than a single address. *Id.* Petitioner asserts that this would have been obvious because such address ranges were known in the art and it “would have amounted to nothing more than the use of a known technique to improve similar methods in the same way or the combination of prior art elements according to known methods to yield predictable results.” *Id.* at 46.

Patent Owner argues that such a modification would not have been obvious because the purpose of the flow database is to identify a specific flow between source and destination hosts. PO Resp. 35–38. Thus, a person of ordinary skill “would have understood that the flow database would not be able to determine how to handle packets from flows requiring a CO connection if the source and destination addresses were ranges.” *Id.* at 37. This proposed modification, therefore, would render Karol inoperable. *Id.* at 38.

We do not find Karol’s flow database to be so limited. As described in Karol, “[f]low database 433 stores information used to determine how to handle packets from flows requiring a connection-oriented service.” Ex. 1006, 7:41–44. Karol describes “[t]ypical fields in each record in the database,” but we find that this description of an exemplary database schema does not limit Karol to a single way to describe or handle a flow. *See id.* at 7:44–45. Petitioner provides evidence that one of ordinary skill in the art would have known how to use address ranges to identify a flow, *see* Ex. 1005 ¶¶ 188–190, and thus, we determine that the proposed modification would not have rendered Karol inoperable. Thus, we are persuaded that Petitioner has shown by a preponderance of the evidence that claims 1 and 13 would have been obvious over Karol.

3. Independent Claims 7 and 19

Claim 7 recites a method for combining connections for access to multiple parallel disparate networks. Independent claim 19 recites limitations similar to those of claim 7, and Petitioner cites similar disclosures from Karol in support of its contention that claim 19 is anticipated by Karol. *Compare* Pet. 22–26 (anticipation assertions regarding

claim 7) *with* Pet. 28–29 (anticipation assertions regarding claim 19). In addition, Patent Owner puts forth similar arguments with respect to Petitioner’s contentions regarding claims 7 and 19. For brevity, we shall discuss these claims together.

Petitioner’s allegations regarding independent claims 7 and 19 may be summarized as follows: Karol discloses combining multiple parallel disparate networks through its discussion of internetworking CL and CO networks. Pet. 11–12; *see* Ex. 1006, 1:7–10. Karol discloses a controller (CL-CO gateway alone or in combination with routers and/or switches) with an interface that connects the controller with source and destination endpoints. Pet. 22. Karol discloses IP addresses for the source and destination in its discussion of routing tables (datagram forwarding database 432 in the CL network and flow database 433 in the CO network). *Id.* at 17–18; Ex. 1005 ¶ 308 (citing Ex. 1006, 7:42–54). According to Petitioner, Karol “selects the CL or CO network by comparing information such as the destination address for each datagram to information in routing tables.” *Id.* at 25 (citing Ex. 1005 ¶¶ 324–329).

According to Patent Owner, Karol does not disclose the recited “selecting/selects, . . . within the controller on a per-packet basis.” PO Resp. 21. Patent Owner supports its contentions with declarations from Joel Williams. Exs. 2001, 2003. Specifically, Patent Owner contends that Karol does not disclose the selection of paths on a per packet basis as required by claims 7 and 19. PO Resp. 21–25. This argument is based on Patent Owner’s contentions that (1) Karol does not select a network when a packet arrives, but rather it routes packets based on precomputed routes; and (2)

Karol's path selection occurs infrequently and not on a per-packet basis. *Id.* at 21.

Petitioner contends that Karol "compares information in each packet received at the CL-CO gateway to determine if the packet will be routed to the CL network interface output line card or to the CO network interface output line card) on a 'per-packet basis' (*e.g.*, each packet routing decision is unique to a particular IP datagram)." Pet. 26 (citing Ex. 1005 ¶¶ 330–331). Petitioner's declarant, Dr. Kevin Negus, testifies that this path selection occurs by examining the packet's destination, the optional presence of alternative paths to that destination, and at least one specified criteria for selecting between alternative paths. Ex. 1005 ¶ 183.

Karol states that "[w]hen a datagram arrives at a CL-CO gateway 140 of FIG. 1, a determination is made if that packet should be carried by the CO network 160." Ex. 1006, 5:23–25. Patent Owner, however, asserts that this determination is not an individualized selection of a route for a specific packet, but rather it is a determination as to whether a packet is part of a group of packets (a flow) for which a routing decision previously has been made. PO Resp. 19–20, 24. Figure 5 of Karol is reproduced below.

FIG. 5

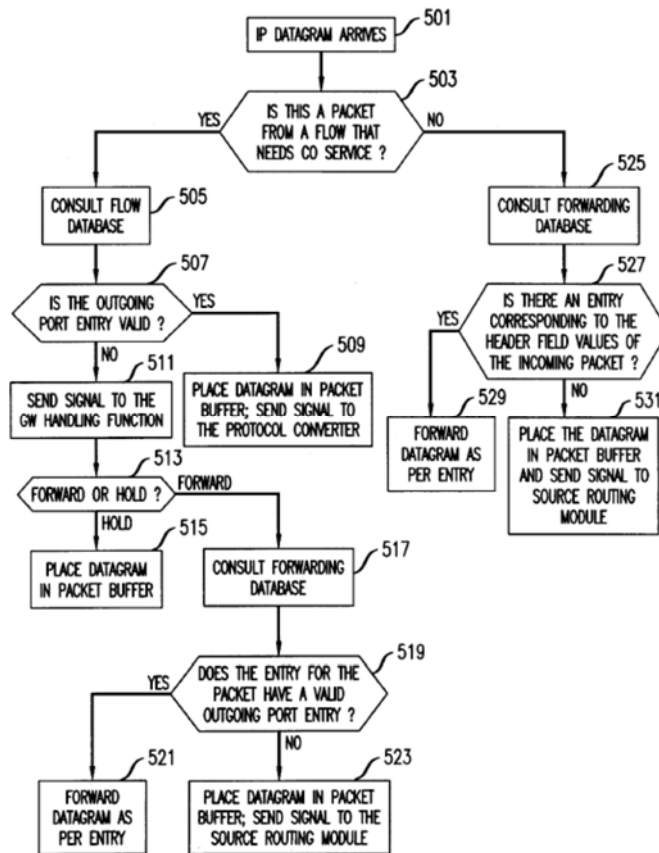


Figure 5 of Karol depicts the packet forwarding process. Ex. 1006, 3:6–8. In step 501, a packet arrives at Karol’s CL router/switch 420. *Id.* 8:56–58. Step 503, then inquires as to whether the received packet is “a packet *from a flow that needs CO Service.*” *Id.* at Fig. 5, element 503 (emphasis added). Thus, we determine that Karol’s routing decisions are made for a flow of packets and not for an individual packet.

As discussed above, we construed “selecting/selects, . . . within the controller on a per-packet basis” to require “selecting a network path for each packet.” *See supra* § II. Thus, we find that Karol does not disclose the per-packet selection required in claims 7 and 19. Therefore, we determine

that Petitioner has not met its burden to establish that claims 7 and 19 are anticipated by Karol.

Petitioner, however, also argues that claims 7 and 19 would have been obvious over Karol. Petitioner relies upon the above described disclosure from Karol and expands upon its anticipation arguments with arguments in which it explains why Karol combined with the knowledge of one of ordinary skill in the art would have rendered claims 7 and 19 obvious. Pet. 53–56, 59.

Petitioner argues that if we construe “per-packet basis” to require selection for each packet then Karol would have rendered this limitation obvious. *Id.* at 55. Dr. Negus testifies that the ’048 patent describes the “prior art [as] disclos[ing] routing decisions that are based entirely upon the origin (for example, source address) of the packet independent of the particular flows or sessions that particular packets from such an origin are associated with (see, for example, Ex. 1003 at 4:11–19).” Ex. 1005 ¶ 334. Petitioner relies upon a passage from the ’048 patent, which describes a “prior approach[]for selecting which network to use for which packet(s)” in which decisions are made based on the origin of the packet. Ex. 1003, 4:11–19. In contrast, Karol describes a selection process in which the gateway makes a determination as to which network should receive the packet based on its examination of the fields of Karol’s flow database, which includes “source address” as one of its fields. *Id.* at 24. Petitioner asserts that it would have been obvious to modify Karol by limiting the routing decision to an analysis of the packet’s source address. *Id.* at 55. In support of this position, Dr. Negus testifies that such a modification would entail “a much simpler and known packet path selection process.” Ex. 1005 ¶ 335.

Patent Owner asserts that Karol's gateway uses OSPF (Open Shortest Path First) to determine routing prior to a packet being received at the gateway. PO Resp. 22. Patent Owner further contends that "[t]he OSPF routing protocol expressly excludes the possibility of making packet routing decisions on a per-packet basis." *Id.* at 24. We find this to be an overly narrow view of Karol's disclosures because Karol is not limited to OSPF. *See* Ex. 1006, 14:20–22 ("the description below assumes the OSPF routing protocol, the concept is readily applicable to other IP routing protocols").

We determine that Petitioner has shown that it would have been obvious to modify Karol to select networks on a per-packet basis. Petitioner has proposed a modification to Karol that is "much simpler" and, therefore, we find that one of ordinary skill in the art would have been motivated to make this modification in order to reduce system complexity. *See* Ex. 1005 ¶ 335. Petitioner has provided arguments and evidence sufficient to show that this modification would be within the abilities of one of ordinary skill in the art and that there would have been a reasonable expectation of success. *See id.* Thus, we find that Petitioner has put forth sufficient evidence to demonstrate that it would have been obvious to modify Karol in a manner that would have taught this limitation.

We have reviewed Petitioner's contentions and evidence regarding the alleged obvious of claims 7 and 19 and find them to be persuasive. *See* Pet. 53–56, 59. For the reasons discussed above, the arguments and evidence put forth by Patent Owner are not persuasive, and we determine that Petitioner has met its burden to demonstrate that claims 7 and 19 would have been obvious over Karol. We find that Petitioner has not met its burden to show that claims 7 and 19 are anticipated by Karol.

4. Analysis of Dependent Claims

Petitioner contends that Karol anticipates claims 3, 4, and 6, which depend from claim 1; claims 9, 10, and 12, which depend from claim 7; claims 15, 16, and 18, which depend from claim 13; and claims 21, 22, and 24, which depend from claim 19. Pet. 18–22, 26–30. Petitioner also contends that claims 2–6, 8–12, 14–18, and 20–24 would have been obvious over Karol. *Id.* at 48–53, 56, 58–60.

a. Obviousness of Dependent Claims 2, 8, 14, and 20

Claims 2, 8, 14, and 20 respectively depend from claims 1, 7, 13, and 19. Claim 2 further recites “wherein the controller controls access to a frame relay private network through a first network interface of the controller, and the controller controls access to the Internet through a second network interface of the controller.” Claims 8, 14, and 20 recite substantially identical limitations as those recited in claim 2. Petitioner asserts that these claims are obvious over the disclosures of Karol and the knowledge of one of ordinary skill in the art. Pet. 48–51, 56, 58, 59.

Petitioner contends that a person of ordinary skill in the art would have substituted a frame relay network in place of Karol’s CO⁵ network. Pet. 48–49. According to Petitioner, frame relay networks were well-known CO networks and the modification only would have required the substitution

⁵ The Petition makes reference to frame relay networks as CL networks and the frame relay network being substituted for Karol’s CL network. *See e.g.*, Pet. 48–49. That, however, appears to be a typographical error. Frame relay networks are CO networks and Dr. Negus refers to them as CO networks in his declaration. *See* Ex. 1005 ¶ 211. Petitioner also states that the reference to frame relay networks as a CO network was a typographical error. Reply 22.

of a known element for another in a manner that would have yielded a predictable result. *Id.* at 49. Petitioner argues that it would have been obvious to make this modification to Karol's system because there were only a finite number of CO networks that could have been used in Karol. *Id.*

Patent Owner argues that Petitioner did not put forth a sufficient obviousness case because it did not articulate why one of ordinary skill in the art would have been motivated to use a frame relay network in Karol's system. PO Resp. 41–42. We do not agree. Karol discusses the use of two disparate networks. Ex. 1006, Abstract. These two networks are referred to as CO (connection-oriented) and CL (connectionless) networks. *Id.* CO and CL are not specific network implementations, but rather descriptive names for categories of networks. Karol provides a list of exemplary implementations of a CO network, "(e.g. ATM, MPLS, RSVP)," but it does not describe this list as exhaustive. *Id.* at 1:9; Reply 20–21 (citing Ex. 1006, Fig. 3, 2:52–58). According to Petitioner, frame relay networks make connections in advance, provide a defined level of service, and high throughput and reliability. Reply 21. Thus, Petitioner's obviousness ground only requires the substitution of a generic placeholder network ("CO network") for an actual implementation of that type of network in order to obtain the useful benefits of that network implementation. As such, we must follow the Supreme Court's guidance that "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement" makes the claimed invention obvious. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007). Therefore, we determine that Petitioner has shown by a preponderance of the evidence that claims 2, 8, 14, and 20 would have been obvious over Karol.

b. Obviousness of Dependent Claims 5, 11, 17, and 23

Claims 5, 11, 17, and 23 respectively depend from claims 1, 7, 13, and 19. Claim 5 further recites “wherein the controller sends packets from a selected network interface to a VPN.” Claims 11, 17, and 23 recite substantially identical limitations as those recited in claim 5. Petitioner asserts that these claims are obvious over the disclosures of Karol and the knowledge of one of ordinary skill in the art. Pet. 52–53, 56, 58, 60.

Petitioner contends that a person of ordinary skill in the art would have substituted a VPN in place of Karol’s CL network. Pet. 52–53. According to Petitioner, VPNs were well-known CL networks and the modification only would have required the substitution of a known element for another in a manner that would have yielded a predictable result. *Id.* Petitioner argues that it would have been obvious to make this modification to Karol’s system because there were only a finite number of CL networks that could have been used in Karol. *Id.* at 53.

Patent Owner argues that Petitioner did not put forth a sufficient obviousness case because it did not articulate why one of ordinary skill in the art would have been motivated to use a frame relay network in Karol’s system. PO Resp. 42–43. We do not agree. Karol discusses the use of two disparate networks. Ex. 1006, Abstract. These two networks are referred to as CO (connection-oriented) and CL (connectionless) networks. *Id.* CO and CL are not specific network implementations, but rather descriptive names for categories of networks. Karol describes Internet Protocol or “IP” networks as an exemplary implementations of a CL network but it does not limit the term to only IP networks. *Id.* at 1:8. According to Petitioner, VPNs provide a secure connectionless network. Reply 22 (citing Ex. 1005

¶¶ 271, 276–277, Ex. 1017, 164:5–10). Thus, Petitioner’s obviousness ground only requires the substitution of a generic placeholder network (“CL network”) for an actual implementation of that type of network in order to obtain the useful benefits of that network implementation. As such, we must follow the Supreme Court’s guidance that “the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement” makes the claimed invention obvious. *KSR*, 550 U.S. at 401. Therefore, we determine that Petitioner has shown by a preponderance of the evidence that claims 5, 11, 17, and 23 would have been obvious over Karol.

c. Dependent Claims 3, 4, 6, 9, 10, 12, 15, 16, 18, 21, 22 and 24

Dependent claims 3, 4, 6, 9, 10, 12, 15, 16, 18, 21, 22 and 24 are challenged as anticipated by Karol (Pet. 18–22, 26–30) and obvious over Karol (*id.* at 49–53, 56, 58–60). Petitioner relies upon similar disclosures from Karol in support of both its asserted anticipation and obviousness grounds for claims 3, 4, 6, 9, 10, 12, 15, 16, 18, 21, 22, and 24. *Compare* Pet. 18–22, 26–30 (asserted anticipation), *with id.* at 49–53, 56, 58–60 (asserted obviousness). Patent Owner makes no specific arguments against these challenges outside of the arguments directed to the independent claims. *See* PO Resp. 44.

We have reviewed Petitioner’s contentions as to these claims and we find that Petitioner has put forth a sufficient showing to establish by a preponderance of the evidence the asserted anticipation and obviousness of these claims.

For example, claims 3, 9, 15, and 21 each recite selecting between network interfaces according to load balancing criterion. Petitioner points

out that Karol discloses that “the advantage to a user is that the user can ask for and receive a guaranteed quality of service for a specific flow” and in addition the “advantage to a service provider is that bandwidth utilization in a packet-switched CO network is better than in a CL network with precomputed routes since bandwidth can be dynamically allocated to flows on an as-needed basis.” Pet. 18 (citing Ex. 1006, 17:18–26; Ex. 1005 ¶ 222). We agree with Petitioner’s contentions as to claims 3, 9, 15, and 21 and find that Petitioner has demonstrated that these claims are anticipated by Karol.

Petitioner provides additional arguments to support its contention that the challenged claim limitations would have been obvious over the disclosures of Karol. For example as to claims 3, 9, 15, and 21, Petitioner explains why Karol and the knowledge of one of ordinary skill in the art would have rendered obvious the limitations of these claims. Pet. 49–51, 56, 58–59). Specifically, Petitioner asserts that load-balancing was common knowledge among people of ordinary skill in the art. *Id.* at 49. Further, persons of ordinary skill in the art would have understood that OSPF performs load balancing by distributing traffic among the routes. *Id.* at 49–50. Thus, this knowledge combined with the disclosures of Karol would have rendered obvious claims 3, 9, 15, and 21, because it only required the application of a known technique in a manner that would have provided a predictable result. *Id.* We find Petitioner’s assertions to be compelling and as such we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 3, 9, 15, and 21 would have been obvious over Karol.

We are similarly persuaded by Petitioner's allegations as to claims 4, 6, 10, 12, 16, 18, 22, and 24. We agree with and adopt as our own Petitioner's contentions regarding the anticipation and obviousness of these claims. We determine that Petitioner has demonstrated by a preponderance of the evidence that claims 4, 6, 10, 12, 16, 18, 22, and 24 are anticipated by and would have been obvious over the disclosures of Karol.

B. Asserted Obviousness over Karol and Stallings

1. Overview of Stallings

Stallings is a book titled *Data and Computer Communications*. Ex. 1011. Stallings is cited in the specification of Karol. Ex. 1006, 12:63–64. Internet protocol (“IP”) is discussed in Stallings as a tool to provide connectionless service between two networks. Ex. 1011, 534. Stallings describes an example in which system A is transmitting a datagram to system B and these systems are on different networks. *Id.* at 535. As part of the routing of that datagram, the router may construct a new packet by appending a header that includes the address of another router on a different network. *Id.* at 535–37. Routing in Stallings “is generally accomplished by maintaining a routing table in each end system and router that gives, for each possible destination network, the next router to which the internet datagram should be sent.” *Id.* at 539.

Routing tables may be static or dynamic. *Id.* Dynamic tables, however, are “more flexible in responding to both error and congestion conditions.” *Id.* “Each router makes routing decisions based on knowledge of the topology and on the conditions of the internet.” *Id.* at 549. In complex networks, dynamic cooperation is necessary among the routers to avoid portions of the network that have failed or are congested. *Id.*

Stallings also teaches that the computation of routes may be based on “user-configurable metric[s]” that may be based on factors such as “delay, data rate, dollar cost, or other factors.” *Id.* at 557. Such route computation may be configured to “equalize loads over multiple-equal cost paths.” *Id.*

2. Obviousness of Claims 1–5, 7–11, 13–17, and 19–23

Petitioner asserts that claims 1–5, 7–11, 13–17, and 19–23 would have been obvious over the teachings of Karol. Pet. 42–60. Petitioner supports its arguments with a declaration from Dr. Negus. Ex. 1005.

Petitioner relies upon similar disclosures from Karol in support of its asserted anticipation and obviousness grounds. *Compare* Pet. 10–30 (asserted anticipation over Karol) *and id.* at 42–60 (asserted obviousness over Karol) *with id.* at 30–42 (asserted obviousness over Karol and Stallings). Stallings is relied upon by Petitioner to provide additional teachings regarding routing tables. *See id.* at 30–42. Dr. Negus testifies that a person of ordinary skill in the art would have been motivated to combine the teachings of Karol and Stallings “because Karol explicitly references Stallings to describe attributes of the CL-CO gateway [] and both Karol and Stallings describe the characteristics of network addresses in routers that can route packets over multiple parallel routes to a destination address as well as methods to obtain such network addresses.” Ex. 1005 ¶ 198 (citing Ex. 1006, 12:59–64).

a. Independent Claims 1 and 13

Petitioner directs us to Stallings’s disclosure of IP routers with “routing tables” that route packets to any one of multiple networks using a range of end-system address associated with a particular route. Pet. 30–31. “Per Stallings, each ‘constituent network’ as identified by its ‘network identifier’

is a ‘subnetwork’ that comprises all of the range of host (or end system) identifiers within the subset range of possible destination or source addresses.” *Id.* (citing Ex. 1011, 528; Ex. 1005 ¶ 191). Petitioner asserts that “it would be obvious to use the routing tables disclosed in Stallings that can route packets to one of multiple network interfaces to route data on Karol’s parallel multiple networks.” *Id.* (citing Ex. 1005 ¶¶ 197–198). Petitioner asserts that this modification would merely have required the application of a known technique in order to achieve predictable results. *Id.* According to Petitioner, one of ordinary skill in the art “would look to combine Stallings because Karol cites to Stallings to describe attributes of Karol’s gateway to parallel data routes.” *Id.* at 31.

Patent Owner contends that Stallings does not teach the use of address ranges. PO Resp. 38. “At best, Stallings generally discusses the topics of: routing, routing tables, and routing protocols.” *Id.* at 38–39 (internal citations omitted). We do not agree. Stallings describes the routing of a packet from end system A to end system B. Ex. 1011, 535. As described in Stallings, the datagram includes a destination address B, “[t]he IP module in A recognizes that the destination (B) is on another subnetwork.” *Id.* Further, “[r]outing is generally accomplished by maintaining a routing table in each end system and router that gives, *for each possible destination network, the next router to which the internet datagram should be sent.*” *Id.* at 539 (emphasis added). Thus, Stallings’s routing table cannot contain just a single address because it maintains routing information for every destination.

Patent Owner further argues that Petitioner has not explained how Stallings could be combined with Karol. Similar to the argument discussed

above in regard to obviousness over Karol alone, Patent Owner argues that Karol's flow database must include individual addresses and not ranges and thus, it is unexplained how Karol could operate if the flow database is modified to include ranges. PO Resp. 39. For reasons discussed above, we are persuaded by Petitioner's contentions that Karol's flow database could be modified to use address ranges that include multiple addresses. *See supra* § III.A.2. (rejecting Patent Owner's contention that Karol would be inoperable if modified to use address ranges).

We are persuaded that Petitioner has set forth sufficient rationale to support its obviousness assertion regarding claims 1 and 13. Thus, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 1 and 13 would have been obvious over the teachings of Karol and Stallings.

b. Claims 2–5, 7–11, 14–17, and 19–23

Petitioner argues that claims 2–5, 7–11, 14–17, and 19–23 would have been obvious over Karol and Stallings. Pet. 31–42. Patent Owner's arguments in regard to these claims have all been addressed in the context of our analysis of Petitioner's asserted ground of obviousness over Karol alone.

We have reviewed Petitioner's contentions as to these claims and we find that Petitioner has put forth a sufficient showing to establish by a preponderance of the evidence the asserted obviousness of these claims. For example, claim 4 depends from claim 1 and further recites "wherein the packet path selector selects between network interfaces according to a reliability criterion, thereby promoting use of devices that will still carry packets on the selected path after the packets leave the selected network interfaces, when other devices on a path not selected are not functioning."

Claims 10, 16, and 22 recite substantially identical limitations. Petitioner's assertions regarding Stallings may be summarized as follows: According to Petitioner, Stallings discusses the use of dynamic routing tables. Pet. 35–36. These routing tables are used in order to avoid portions of the network that are congested or are experiencing a failure. *Id.* at 36. Stallings describes link state routing algorithms that update the system's routers as to the state of the local links. *Id.* Petitioner directs us to Stallings's teachings regarding a reliability criterion known as Internet Control Message Protocol ("ICMP") in which the provision of feedback regarding communications problems is used to determine if a datagram can reach its intended destination. *Id.* (citing Ex. 1011, 546–549; Ex. 1005 ¶ 255). Petitioner asserts that this exemplary reliability criterion could have been applied to Karol's system to allow the system to avoid congested or failed links. *Id.* at 37 (citing Ex. 1005 ¶ 257). We find that Petitioner has put forth a sufficient rationale and evidence to support its assertion of obviousness. Patent Owner makes no additional argument in regard to claims 4, 10, 16, and 22 other than those directed at their respective base claims. *See* PO Resp. 44. Thus, based on our review of the full record, we find that Petitioner has demonstrated by a preponderance of the evidence that claims 4, 10, 16, and 22 would have been obvious over the teachings of Karol and Stallings.

We are similarly persuaded by Petitioner's allegations as to claims 2, 3, 5, 7–9, 11, 14, 15, 17, 19–21, and 23. We agree with and adopt as our own Petitioner's contentions regarding the obviousness of these claims. We determine that Petitioner has demonstrated by a preponderance of the evidence that claims 2, 3, 5, 7–9, 11, 14, 15, 17, 19–21, and 23 would have been obvious over the disclosures of Karol and Stallings.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that: (1) claims 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21, 22, and 24 are anticipated by Karol; (2) claims 1–24 would have been obvious over Karol; and (3) claims 1–5, 7–11, 13–17, and 19–23 would have been obvious over Karol and Stallings.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–24 of the '048 patent are held *unpatentable*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Andy H. Chan
Charles F. Koch
PEPPER HAMILTON LLP
chana@pepperlaw.com
kochc@pepperlaw.com

PATENT OWNER:

Robert Mattson
Sameer Gokhale
OBLON, MCCLELLAND, MAIER & NEUSTADT, LLP
cpdocketmattson@oblon.com
cpdocketgokhale@oblon.com